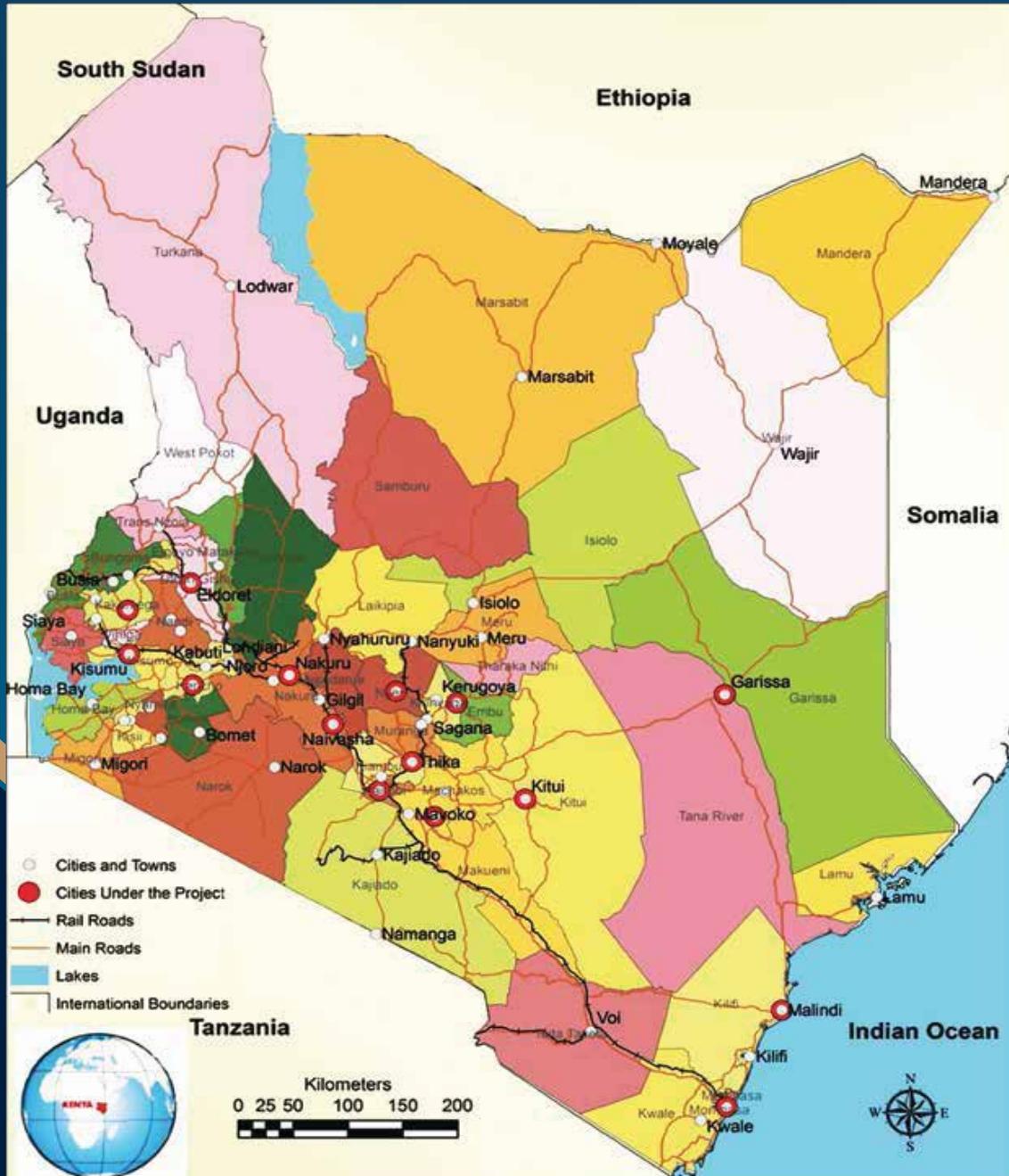


# Kenya

## STATE OF THE CITIES



# KITUI



WORLD BANK GROUP



# KENYA STATE OF THE CITIES BASELINE SURVEY

STATISTICAL ABSTRACT FOR KITUI, KENYA



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## ABBREVIATIONS

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<b>CAPI</b>	Computer Assisted Personal Interview
<b>EA</b>	Enumeration area
<b>GOK</b>	Government of Kenya
<b>HH</b>	Household
<b>HUD</b>	U.S. Department of Housing and Urban Development
<b>KIHBS</b>	Kenya Integrated Household Budget Survey
<b>KISIP</b>	Kenya Informal Settlements Improvement Program
<b>KMP</b>	Kenya Municipal Program
<b>KNBS</b>	Kenya National Bureau of Statistics
<b>NMSP</b>	Nairobi Municipal Service Project
<b>PDA</b>	Personal Digital Assistant, in this case a hand held computer used by interviewers
<b>PSU</b>	Primary Sampling Unit
<b>SMSA</b>	Standard Metropolitan Statistical Area
<b>SRS</b>	Simple Random Sample
<b>SSU</b>	Secondary Sampling Unit
<b>WB</b>	World Bank
<b>WBG</b>	World Bank Group



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# INTRODUCTION

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## Background

The Kenyan government, with the support of development partners, is increasing its investments in urban infrastructure and services. To support these efforts, the World Bank contracted NORC at the University of Chicago to carry out a baseline study of the demographic, infrastructure, and economic profiles of fifteen Kenyan towns and cities: Nairobi City, Mombasa, Naivasha, Nakuru, Malindi, Eldoret, Garissa, Embu, Kitui, Kericho, Thika, Kakamega, Kisumu, Machakos, and Nyeri. This was undertaken in order to deepen understanding of the cities' growth dynamics, and to identify specific challenges to quality of life for residents. The study, called the "Kenya State of the Cities Baseline Survey," collects and analyzes household survey data to produce key statistics and identify differences in conditions among types of households—especially differences between those living in informal versus formal settlements. The ultimate goal is to use the information to establish development priorities for infrastructure and service investments and, eventually, to track the effectiveness of these investments.

Prior to the State of the Cities survey, there were little data available to support the design of programs to improve infrastructure and related services in most Kenyan cities. While there have been several household surveys of Nairobi's informal settlements and numerous analyses using the data, few surveys or analyses have been carried out in other Kenyan towns and cities or for modest-income areas in Nairobi.

To facilitate access to the rich datasets generated by the survey, three written products were commissioned: a Statistical Abstract (such as this one) for each city, a City-at-a-Glance for each city (a two-page summary of the Abstract), and an Overview Report (a more comprehensive discussion of the topics in this Introduction, a topic-by-topic comparative analysis of the fifteen cities, and appendices with the survey instrument). The Abstract's objective is to provide comprehensive but easily accessible information on the wide range of municipal conditions covered in the survey, as reported by households. Some information in the Abstract also comes from secondary sources, such as the national Census and the Kenya Integrated Household Budget Survey (KIHBS). The primary audience for the Abstract includes policy makers, development practitioners, development partners, civil society organizations, and urban residents. Better planning and more productive investments can result from exploiting the information in each city's Abstract.

## Methodology

For this baseline household survey, NORC used a two and three-stage, stratified, clustered sampling design intended to be representative of poor and non-poor households living in formal and informal settlements in the fifteen cities included in the study. The first-stage sampling frame was based on Kenya's 2009 census frame of enumeration areas (EAs). In the census sample frame, EAs are identified as urban, peri-urban or rural. EAs are further identified as containing formal or informal settlement types. For the first stage sampling, NORC selected EAs from strata identified as informal (slum), urban-formal, peri-urban-formal and rural. In cases where the EAs were "large" (200 to 700 households), they were divided in half, thirds, or quarters and one segment was randomly selected.

For the final stage of sampling, NORC carried out a full household listing in each selected EA (or segment, as the case may be) and randomly selected ten households for interviewing.<sup>1</sup> Because expected response rates were unknown prior to data collection, interviewers were given a target to complete at least seven interviews in each EA. In Kitui, 93 EAs were selected in the first stage.<sup>2</sup> In the second stage, a total of 5,570 households were listed and 932 households were selected.

The data for this report are based on 660 completed interviews carried out in Kitui from November 12, 2012 to February 28, 2013 by a team of four interviewers and one supervisor. Among eligible households,<sup>3</sup> the completion rate was 70.82%.<sup>4</sup> 106 interviews were completed in informal settlements and 554 were completed in formal weighting the sample to formal settlements.

## Questionnaire

The Kenya State of the Cities baseline questionnaire was developed iteratively using a base set of questions developed by the World Bank and refined to capture the key variables related to infrastructure access and municipal services of interest to the Kenyan government. The final fielded questionnaire is available in Volume II of the Overview Report. The household listing form and the questionnaire were programmed for use as a Computer-Assisted Personal Interview (CAPI) and both were carried out using 7-inch Samsung Galaxy Tab tablet computers which transmitted data to project servers via the mobile phone network. Interviewers used the tablet computers to capture GPS coordinates once during listing and again at the end of each interview.

## Data Quality

Recorded administration time of the CAPI instrument showed a median duration of 23 minutes in Kitui (21 minutes across all towns and cities). However, duration values may have been compromised by transmission problems and supervisor reviews, which may have overwritten timestamps. Despite the uncertainty of exact durations, data quality measures do not show systematic interviewer-related errors in the final data. Approximately one-third of all interviews underwent validation, including call-backs by supervisors or central office staff (in-person and by phone).

## Table Presentation

Each city's Abstract includes a set of tables designed to provide basic information on households' economic and demographic conditions, their housing conditions, and access to infrastructure and services. One challenge in preparing the Abstract was to provide a complete picture of conditions while still being selective in the information presented so as not to overwhelm the reader. A second challenge was to display the information in a way that permits stakeholders to understand conditions faced by different population groups.

To meet these challenges we have developed a set of tables with items believed to be most important for stakeholders and have broken down the items in several ways. In addition to providing an overall picture of household (HH) characteristics, the tables illustrate whether household characteristics differ by key factors.

<sup>1</sup> A complete description of the sampling design is found in "Kenya Municipal Program State of Cities: Overview Report," NORC, August 2013.

<sup>2</sup> 106 EAs were included in the listing activity. One EA did not include any households and therefore was dropped from the sample.

<sup>3</sup> Eligible households are defined as occupied dwellings with at least one resident age 18 or older who is present during the field period.

<sup>4</sup> The completion rate is the number of households that successfully completed an interview over the total number of households assigned.

The rows of each table generally list the household characteristics (e.g., size of household, percentage of children in school). The columns present statistics for the entire city, then show how the data differs by location (informal vs. formal areas), household poverty status (poor vs. non-poor), gender of the head of household (male vs. female headed, for informal areas only), as well as other factors pertinent to the particular table.<sup>5</sup>

From each table, one can quickly observe if there are large differences in household characteristics by location, spending power, etc., simply by comparing the cells (numbers). Each table also shows whether the observed differences are statistically significant.<sup>6</sup> “Statistically significant” means that statistical analysis has revealed that a difference, no matter how small or large, is unlikely due to chance or randomness. In practice, statistically significant differences are the ones researchers are interested in—they can be interpreted as telling us about meaningful differences in household characteristics by location, spending power, gender, or other category. When we discuss differences in the text of this report, we will refer to “statistically significant” differences unless otherwise noted.

In terms of policy decisions, whether differences matter is a combination of whether they are statistically significant and how large the differences are. Ultimately, it is up to the policy practitioner to decide how large a difference must be to matter in the context of interest. An important note when interpreting results is that statistical significance does not imply causality. In other words, if differences in values are statistically significant, this does not mean that one variable caused a change in the other variable. Another factor may be influencing both variables; for example, for we may find a “significant” difference between head-of-household education and household poverty, perhaps the key common cause is social status, which affects both their educational attainment and job/spending opportunities. Additionally, where a statistically significant difference is identified it does not imply the direction of the relationship. Perhaps the household poverty is the reason for the different education levels, or vice-versa. In this report, therefore, we will say a household characteristic is “associated with” or “correlated” with certain factors, rather than saying one is caused by another.

In order not to clutter the tables yet provide the reader with the maximum information, we mark statistically significant results in the tables with bold (for two adjacent values in the same row) and italics (to compare adjacent columns of data). Underlined values denote an insufficient number of household responses for some enumeration category of the sampling design to perform a test of statistical significance. The number of observations for a particular variable is noted in the tables in rows denoted by “N”. Cells with no observations are indicated with hyphens (-).<sup>7</sup> The table, below, summarizes the formatting used in tables throughout the Abstract: A value that is both bold and italicized indicates statistically significant differences for two adjacent cells (i.e., values in the same row) as well as for the distributions between adjacent columns. In contrast, a value in standard font-no bolding, italics, or underlining-still means that a significance test was performed but that the values under comparison were not statistically significantly different from each other.

<sup>5</sup> Informal/formal status was defined at the enumeration area level by the Kenya National Bureau of Statistics during the 2009 Census. Poor/non-poor is defined using the answer to a question asking respondents whether their total household expenditure in the last month was above or below a poverty line calculated using the household size (5,567 KSh for each adult 15 years and older + 3,619 KSh for each child aged 5 to 14 + 1,336 KSh for each child under 5 years old).

<sup>6</sup> Statistical significance is noted when a test achieves a p-value  $\leq 0.05$ .

<sup>7</sup> Regarding issues of non-response, both observational and item-specific, see Section 4, below.

There is one caveat to the formatting rules that must be addressed regarding the significance testing of distributions. While the absence of italics sometimes means that the distribution was tested and was not found to be statistically significant, this is often not the case – i.e., there are many distributions which were not tested for significance. To avoid confusion, the comprehensive list of distributions which were tested for significance follow.

- **Table B.2a:** Expenditure ranges by location, tenure, water connection, business, skilled/unskilled head, and gender of household head (in informal areas)
- **Table B.2b:** Income ranges by location, tenure, water connection, business, skilled/unskilled head, and gender of household head (in informal areas)
- **Table C.3:** Distribution of home value ranges and rent ranges by location, tenure, water connection, business, skilled/unskilled head, and gender of household head (in informal areas)
- **Table D.1a:** Percent of households with a piped water connection inside their dwelling by security of ownership; percent of households with a piped water connection inside their compound by security of ownership; percent of households close to piped water access by security of ownership; cost of water by security of ownership; most important water source by security of ownership; reasons for no connection by security of ownership.
- **Table D1.b:** Water source by water quality; water provider by water quality; water treatment buy water quality; treatment methods by water quality.

**Table 1: Description of formats used to denote statistical significance**

Format	When we use it	Example
Bold	Two bolded values in the same row next to each other indicate that the difference is statistically significant.  We also use bold for 'Yes' or 'No' variables. If bold, it means that the difference between the mean of households that answered 'yes' (displayed) and the mean of those that answered 'no' (not displayed) is statistically significant. <sup>(a)</sup>	Table A.1 displays the mean household size for households located in formal and informal settlements; if the pair of values is bold, it means that the difference in household sizes between formal and informal areas is statistically significant.  Table B.2 displays the proportion of households which own land (or have tenure) that fall below the poverty line. If bold, it means that this proportion is statistically significantly different from the proportion of households which do not own land that fall below the poverty line.
Italics	We indicate statistically significant differences between columns of three or more cells using italics; this means the difference between the entire distributions (columns) is statistically significant. <sup>(b)</sup>	Table B.2, Monthly household spending power, displays the distribution of households across income and expense ranges. If values appear italicized in both columns for households located in formal and informal settlements, the difference between the two distributions is statistically significant.
Underline	Denotes values where, due to lack of data at the census tract (enumeration area, or EA) level, it was not statistically possible to conduct the significance test. <sup>(c)</sup>	Table B.3 shows the mean value of households' primary residence with and without land, and of any other residence and/or land. An underlined value means that due to lack of data at the census tract level, it is not possible to perform a test for significant differences.
Hyphen (-)	In cases where there are no data for a cell at all, we note that with a hyphen. <sup>(c)</sup>	Table B.3 shows data related to household finance. For the percentages of households according to source of financing, the cells that display a hyphen means that there were no observations for that particular variable and category.

Notes:

- Here a p-test from an Adjusted Wald test is conducted.
- Here Pearson's Chi-squared test is conducted.
- At least two households are required to compute a household-level variance, which is required to conduct a hypothesis test. Note that this does not imply that the respective table values are based on just one household or even just one EA.

Another feature of the data worth mentioning is that outliers (responses that are very different from all the others) were not a major issue in the survey data, affecting just three variables in any important way.<sup>8</sup>

Finally, note that in tables presenting a distribution of responses, if some response categories are left out then the distribution will not add up to 100%. In cases where all response categories are listed then the first row of responses is given as 100. Unless otherwise noted, all figures presented in the tables are percentages.

The core of this abstract comprises a set of tables divided into chapters. Each chapter contains a textual summary of each table and highlights some of their implications. The tables are divided into four groups:

- A. Household characteristics – 3 tables
- B. Economic profile – 5 tables
- C. Tenure, tenure security, dwelling characteristics – 4 tables
- D. Infrastructure services – 7 tables

Notes to the tables are identified by small letters appearing as superscripts at the end of each table. All tables present weighted figures at the household level, unless otherwise noted, to reflect the total population of the respective table cell. The N values, however, present the unweighted number of households, unless otherwise noted.

The final chapter of this abstract contains a series of three “Development Polygons”. These complement the detailed tables presented in sections A through D by illustrating an “overall” sense of the state of the city. The figures included are the Development Diamond, the Infrastructure Polygon, and the Living Conditions Diamond.<sup>9</sup>

While the tables generally have a common set of column headings, there is some variation. The following are definitions for those headings that require clarification:

*Informal/Formal Areas* – This distinguishes between areas based on whether most households in the area have property title and official services. It is a designation provided by a status code at the level of the EA (Enumeration area) as used by the National Census.

*Gender (Informal)* – For the households living in the locations coded as “Informal,” data for household characteristics are provided for both male- and female-headed households. As is standard, the male-headed households may contain the spouse while female-headed households do not.

*Class (of durable)* – Durable assets are a standard measure of household wealth. They are grouped into three classes, roughly based on their likely market value and degree of permanence. The actual items in each class are indicated in the table. The values reported for these categories are the number owned by the household, not their average or total value.

<sup>8</sup> Across all fifteen towns and cities these were (i) home value, in which 20 responses were reported in millions units instead of as the value itself (so we simply divided these responses by a million); (ii) 40 respondents reported travel time for a weekly or monthly commute rather than a daily commute (these over-eight-hours responses were dropped); (iii) we removed one case in which the time to get water was over a week.

<sup>9</sup> The basic format for all three figures appear in the World Bank Policy Research Working Paper, “Poverty, Living Conditions, and Infrastructure Access” A Comparison of Slums in Dakar, Johannesburg, and Nairobi” by Sumila Gulyani, Debabrata Talukdar, and Darby Jack (2010). We strived to make our own figures as similar as possible, though some deviations, noted in the accompanying text, were necessary.

*Spending Power* – The total value of household expenditures collected by the survey, excluding rent or mortgage payments.

*Access to Infrastructure* – This indicator combines six categories of infrastructure (divided into 13 subcategories) weighted by importance to the household and summed to create a household indicator from 0 to 9.5. See NORC (August 2013), “Kenya Municipal Program State of the Cities: Overview Report” for a more detailed description.

*Household Poverty* – The poverty line varies depending on the number of members of the household and their age. It is calculated by adding together:

- 5,567 KSh per month for each adult 15 years and older in household
- 3,619 KSh per month for each child aged 5 to 14 in household
- 1,336 KSh per month for each child under 5 years old in household



# HOUSEHOLD CHARACTERISTICS

This section presents basic household characteristics. Table A.1 provides information on household size and household member distribution by age category. Table A.2 details the level of education of the members of household, as well as the proportion of children and adults of different ages who were currently in school at the time of the survey. Finally, Table A.3 presents household health characteristics, including the proportion of children under 15 who have received the BCG vaccine (an immunization against tuberculosis), a major public health concern given that Kenya is a high-tuberculosis-burden country.<sup>10</sup> Table A.3 also includes the number of household members with an illness or injury in the two weeks prior to the survey, the proportion of those members who visited a health practitioner, average household medical expenditures for the month preceding the survey, and the percentage of households that have health insurance. All of these figures are given comprehensively and broken down by location type, the household's poverty status, and the gender of head of household (among informal areas).

## A.1 Household Demographic Composition

The 2009 census estimated that the municipality of Kitui had a population of 109,568, a 3% increase over the figure reported in the 1999 census; this represents a .25% annualized average growth rate.<sup>11</sup>

The average household size in Kitui is 3.86 members, and there are statistically significant differences by location and poverty status. Households in informal areas are actually smaller, on average, than those in formal areas (2.96 vs. 3.92). Households under the poverty line are larger; they average 4.28 members while households above the poverty line average only 2.83 members.

On average, 65% of households' members are aged 15 to 60 years old, 19.2% are between 5 and 14 years old, 10.1% are under 5 and only 4.8% are over 60. Kitui households in informal areas had a significantly higher percentage of adults 15 to 60 years old but a lower percentage of children (5 to 14 years old) and a lower percentage of adults over 60 than households in formal areas. Non-poor households had a significantly higher percentage of adults 15 to 60 years old and a lower percentage of children under 5 and aged 5 to 14 years old than poor households. The head of household is male in 75% of all households, and this percentage was significantly and numerically higher in poor households. Nearly all (94%) female-headed households are located in formal areas, and 64% of female-headed households are poor.

## A.2 Household Education Characteristics

Kitui was part of Eastern province, where in 2009 primary classrooms had an average class size of 32 students and secondary classrooms had on average 33 students. Student-teacher ratios in the former Eastern Province were, on average, 40.3 for primary schools and 19.1 for secondary schools.<sup>12</sup>

<sup>10</sup> World Health Organization Global tuberculosis report 2012, retrieved June 12th 2013 from [http://www.who.int/tb/publications/global\\_report/en/](http://www.who.int/tb/publications/global_report/en/)

<sup>11</sup> From Statistical Abstract 2010 and Statistical Abstract 2006, Kenya National Bureau of Statistics.

<sup>12</sup> Provinces no longer exist in Kenya. This data is based on the Kenyan Institute for Public Policy Research and Analysis 2009 Economic Report, Table A3.16, pg. 192, per Ministry of Education statistics, [http://www.marsgroupkenya.org/pdfs/2009/10/Kenya\\_Economic\\_Report\\_2009.pdf](http://www.marsgroupkenya.org/pdfs/2009/10/Kenya_Economic_Report_2009.pdf) Section

**Table A.1: Household demographic characteristics**

Characteristic	All	Location		House hold poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Number of households							
Weighted	21,454	1,219	20,235	14,835	5,185	882	319
N (unweighted)	656	105	551	421	204	74	29
Size of household	3.86	2.96	3.92	4.28	2.83	2.97	2.82
N	658	105	553	422	204	74	29
Mean percent of household members aged:							
Total	100	100	100	100	100	100	100
Under 5	10.1	10.9	10.0	11.4	8.8	10.2	11.8
5 to 14	19.2	7.5	19.9	22.3	12.9	5.5	12.2
15 to 60	65.0	79.8	64.1	61.1	73.4	82.9	72.7
Over 60	4.8	1.4	5.0	4.3	4.8	1.1	2.3
N	656	105	551	421	204	74	29
Proportion of households...							
Male-headed	75	73	76	79	65		
Female-headed	25	27	24	21	35		
N	630	103	527	404	198		
Female-headed distribution		6	94	64	36		
N		164	158				

The first panel of Table A.2 presents statistics on the education of all individuals aged 5 years and older within the surveyed households. Thirty-one percent of all individuals have completed secondary school or higher—a figure that is likely skewed by the fact that the majority of household members includes ages spanning 15 to 60 years old—and 64% completed primary or higher. Significant differences in education level were by location, poverty status, and gender of household head. Perhaps surprisingly, a significantly higher percentage of individuals in informal areas had higher education as compared to formal households; less surprisingly, non-poor households had a significantly higher percentage with higher education than poor households and the difference was dramatic (28% vs. 8%); by contrast, in poor households, individuals highest grade completed was significantly more likely to be some or all of primary school compared to non-poor households. Having “no education” is rare at 4% overall, and was significantly higher for female-headed households than for male-headed households.

The second panel of the table shows the mean percent of adult individuals over 18 years within each household. This is done to show intra-household educational levels among households’ adult members. We find that, on average, 40.5 % of a household’s adults have completed secondary school or higher. In Kitui, only 16.1% overall had any higher education. However, 81% completed primary or higher. Only 3.6% of households’ adults had no education whatsoever; for 33.3% primary was the highest grade completed, and for 14.7% some primary was the highest level of education completed. By location, household’s adults in formal areas were significantly more likely to have no education those in informal areas. Significant differences in education level by category for adults were also evident by poverty status. Households above the poverty line were significantly more likely to have adults with higher education, while poor households

were significantly more likely to have primary as the highest grade completed (32.3% had higher education in non-poor households while only 11% had higher education in poor households). Finally, the percentage with higher education was significantly higher for male-headed households than for female-headed households, and the difference was dramatic (29.3% vs. 12.4%).

**Table A.2: Household education characteristics**

Characteristic	All	Location		House hold poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Percent of individuals 5 and older with highest grade completed:							
Total	100	100	100	100	100	100	100
None	4	2	4	3	2	0	10
Some Primary	33	21	34	36	25	18	25
Completed primary	24	25	23	25	16	26	23
Some secondary	9	11	9	9	9	11	13
Completed secondary	19	22	19	19	20	22	22
Higher	12	18	11	8	28	23	7
N	2,069	268	1,801	1491	478	186	74
Mean percent of household's adults over 18 with highest grade completed:							
Total	100	100	100	100	100	100	100
None	3.6	0.9	3.7	3.1	1.1	0.0	3.4
Some Primary	14.7	10.9	14.9	15.5	11.2	10.3	11.2
Completed primary	33.3	31.9	33.3	37.5	20.9	32.4	30.6
Some secondary	7.2	6.8	7.2	6.6	8.8	5.4	9.4
Completed secondary	24.4	25.0	24.4	25.4	24.7	22.6	33.1
Higher	16.1	24.5	15.6	11.0	32.3	29.3	12.4
N	656	105	551	421	204	74	29
Percent of individuals in school by age group:							
5 to 14	95.3	88.5	95.4	95.9	92.5	100.0	73.5
N	311	23	288	240	62	12	10
15 to 18	72.4	74.7	72.3	78.8	50.6	82.8	65.2
N	157	15	142	116	31	10	4
Over 18	8.0	5.0	8.2	7.2	9.9	5.8	2.9
N	654	105	549	421	203	74	29

The third section of the table shows enrollment figures: 95.3% of individuals aged 5 to 14 years old are currently in school; 72.4% of individuals 15 to 18 are enrolled, and 8% of individuals over 18 are enrolled in school (a figure which would include adults no longer planning on attending school). Any differences in enrollment by location, poverty status, or gender of head of household were not statistically significant or were not able to be tested for significance due to a lack of data at the census tract level.

### A.3 Household Health Profile

Kitui was part of Eastern province, which in 2005 had an average of 8.8 doctors and clinical officers and 49 nurses per 100,000 residents.<sup>13</sup> The former Eastern province had an average of 10.9 medical facilities per 100,000 residents, including hospitals, clinics, dispensaries, and other types of facilities.<sup>14</sup>

Overall, fully 98% of households report their children under 15 have received BCG (tuberculosis) immunizations. Twelve percent of households had a sick or injured household member in the two weeks prior to the interview and 76% of these visited a health practitioner. Household medical expenses averaged 724 KSh in the month prior to the survey, and varied dramatically by location and poverty status, but these differences were not statistically significant.

Rates of health insurance coverage are quite low overall (15%). Percent of households with health insurance varied significantly by area type, with those in formal areas having higher rates of insurance (16%) than in informal areas (10%).

**Table A.3: Household health characteristics**

Characteristic	All	Location		House hold poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Percent of household's children under 15 having received BCG immunization	98	89	98	98	99	90	90
N	426	53	373	318	98	32	19
Percent of households with an injured/ill member, previous two weeks	12	10	12	14	8	9	14
N	658	105	553	422	204	74	29
Percent of ill household members that visit a health practitioner, previous two weeks	76	78	76	77	77	77	80
N	86	12	74	65	17	7	5
Household medical expenditures (KSh), previous month	724	169	756	545	222	191	122
N	652	102	550	419	203	71	29
Percent of households with health insurance	15	10	16	14	20	12	5
N	656	104	552	422	203	73	29

<sup>13</sup> 2004/2005 numbers of healthcare providers obtained from Partners for Health Reformplus 2006 Report, Table A1, pg. 39, Annex A, statistics obtained from Rep. of Kenya. [www.healthsystems2020.org/files/1654\\_file\\_Tech101\\_fin.pdf](http://www.healthsystems2020.org/files/1654_file_Tech101_fin.pdf). Per capita figures calculated by dividing by 2005 (estimated) population obtained from the Kenya Integrated Household Budget Survey, Table 3.1, [http://www.knbs.or.ke/pdf/Basic%20Report%20\(Revised%20Edition\).pdf](http://www.knbs.or.ke/pdf/Basic%20Report%20(Revised%20Edition).pdf).

<sup>14</sup> Based on most current (undated) figures from Kenya Bureau of Statistics Open Kenya online database, <https://kenya.socrata.com/Health-Sector/Health-Facility-Pie-Chart/yr4-763w>. Per capita figures calculated by dividing by 2009 census population, obtained from 2010 Statistical Abstract, Kenya National Bureau of Statistics.

# HOUSEHOLD ECONOMIC PROFILE

## B.1 Household Occupational Composition

Table B.1 presents the current occupation, or main activity, of household members. The first panel shows the percent of all adults over 18 in each of the occupations. The five most prominent occupation categories are regular employee, casual employee, self-employed, student and homemaker, and only 4.1% are unemployed, with 3.9% looking for work. Individuals in informal areas are more likely to be employers, but also unemployed not looking for work, compared to those in formal areas. Adults in non-poor households are more likely to be employers, regular employees, or pensioners than in poor-households. Adults in male headed households in informal areas are significantly more likely to be regular employees than their male-headed counterparts (26.1% vs. 6.3%).

The second panel shows the average percent of adults over 18 within each household that are occupied in each of the categories. This is done to show intra-household occupational status among households' adult members. The results here are similar to those in the first panel above. Here, we find that on average, about half (51.6%) of a household's adult members are either regular employees, casual employees, or self-employed. Within each household, 3.8% are unemployed (3% are looking for work, and .8% are not looking), 22.6% are homemakers and 6% are students. Significant differences are similar to the first table, varying by poverty status and location, but also by gender of head of household for homemaker. Individuals in informal areas are more likely to be employers or regular employees, but also unemployed not looking for work, compared to those in formal areas. Adults in non-poor households had on average slightly more employers, had on average twice as many regular employees, and had almost three times as many pensioners as non-poor households, but there were no significant differences in unemployment by poverty status. Male-headed households had a slight but significantly higher proportion of homemakers than female-headed households.

**Table B.1: Household members' main activity**

Occupation <sup>a</sup>	All	Location		House hold poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Percent of adults over 18 with occupation:							
Employer	0.5	1.7	0.4	0.0	2.2	2.2	0.0
Regular employee	14.0	20.9	13.6	10.5	28.9	26.1	6.3
Casual employee	18.1	17.2	18.1	19.8	14.8	16.0	22.1
Self-employed	12.8	15.5	12.6	13.3	14.0	14.1	20.9
Unpaid family worker	0.1	0.0	0.1	0.2	0.0	0.0	0.0
Apprentice	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Student	8.0	6.5	8.0	8.4	7.0	7.1	5.0
Pensioner/investor	2.8	0.0	2.9	2.3	5.6	0.0	0.0
Earning from investments/ property	0.5	0.8	0.4	0.4	0.8	0.3	2.5
Sick/unable to work	1.5	0.9	1.6	1.8	0.7	1.3	0.0
Unemployed looking for work	3.9	6.5	3.7	4.4	2.4	6.3	7.4
Unemployed, not looking for work now	1.2	6.3	0.9	1.2	0.3	5.9	6.0
Homemaker	23.9	22.6	24.0	24.6	19.3	20.4	28.3
N	1,403	217	1,186	964	361	156	57
Mean percent of household's adults over 18 with occupation: <sup>b</sup>							
Employer	0.6	2.5	0.4	0.1	2.2	3.4	0.0
Regular employee	14.4	23.7	13.8	10.8	26.3	30.1	7.4
Casual employee	22.6	22.9	22.6	23.5	22.3	19.6	33.1
Self-employed	14.6	15.8	14.5	14.7	16.5	13.0	24.3
Unpaid family worker	0.1	0.0	0.1	0.2	0.2	0.0	0.0
Apprentice	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Student	6.0	5.2	6.1	6.4	5.0	5.1	5.7
Pensioner/investor	2.7	0.0	2.9	1.8	6.1	0.0	0.0
Earning from investments/ property	0.4	0.7	0.4	0.3	0.4	0.3	1.6
Sick/unable to work	1.5	1.0	1.6	1.9	0.7	1.4	0.0
Unemployed looking for work	3.0	4.1	3.0	3.7	1.2	4.8	2.3
Unemployed, not looking for work now	0.8	3.9	0.7	0.8	0.3	3.5	3.5
Homemaker	22.6	19.5	22.7	24.7	14.7	18.4	21.6
N	656	105	551	421	204	74	29

Notes:

- a. The category "Other" has been omitted.
- b. These numbers are obtained by first computing the percentages of each household's members in each category, and then taking the mean of these percentages over all households.

## B.2 Household Income/Expenditure Levels

There are two general approaches to measure spending power: expenditure and income, both of which are shown in the tables below. In the survey, income derives from household members' salaries, business earnings, rents, public cash support, and earnings from financial assets in the month prior to the interview, but does not include any remittances. Expenditures include all purchases, including investments for household-owned businesses. In theory, both approaches express the same amount of spending power, but typically one approach is not enough, especially when estimations are based on survey data. This is because survey respondents' perceptions about their income and expenditures can be unreliable; estimates vary depending on seasonal changes in economic activities, type of assets owned, household's cash flows, and in-kind payments.

In practice, the expenditure approach is usually more accurate because most respondents, making purchases daily, recall their expenses better. Income, on the one hand, can be problematic because it can be subject to respondent misreporting (e.g., desire to impress the enumerator) and, with non-wage income; respondents do not generally make a clear distinction between revenue (sales) and income (revenue minus expenses). Using both methods, therefore, provides an additional level of verification.

Fully 74% of Kitui households have monthly expenditures below the poverty line, as determined by the household composition. Poverty as such is significantly higher in formal areas vs. informal areas, 75% for formal areas 58% in informal areas, but there were many fewer respondents in informal areas (101) than in formal areas (525). Female-headed households also have a larger percent below the poverty line (77%) than male-headed households (52%), though this result is not significant. However, the proportion of households below the poverty line as measured by expenditures is significantly lower among households with tenure or a water connection. The percent of households below the poverty line is also significantly lower among those that work in a "skilled" profession as compared with those who do not.

Looking at the overall average expenditure distribution, nearly 80% of Kitui households fall into the 6,000-30,000 KSh range category; only 9% spend more than 30,000 KSh/month. As indicated by the italics, the entire household expenditure distribution varies significantly by whether the households have a water connection and by head of household work skill status. Households with water connection or a skilled worker head have expenditures at the higher end of the spectrum as compared to those without.

In B2.b, average income distributions reveal more households at the lower end of the spectrum than expenditures; nearly 30% of households make 6,000 KSh/month or less, while by expenditure only 12% report spending that little. There was not enough data at the census tract level to test whether income differed significantly by most household characteristics.

On average, households who sent money to individuals outside their household (cash transfers) sent an average of 5,659 KSh in the three months prior to the interview, and those that received remittances received an average of 14,424 KSh during the same period. Households at the higher end of the expenditures spectrum (wealthier households) were more likely to send money than those in the bottom; in the "Transfers" column, we see that 80% of households in the top expenditure category sent money to friends or relatives, compared to only 14% of those in the bottom category. However, the proportion of households receiving remittances (transferred income) was more evenly dispersed among income levels,

although the highest percent of households receiving remittances was the lowest income group, among whom 37% received remittances. There was not enough data at the census tract level to test whether transfers and remittances differed significantly by household characteristics.

**Table B.2a: Monthly household spending power, as measured by expenditure**

Characteristic	All	Location		House hold has...			House hold head is <sup>c</sup>		Gender (Informal)		Value of transfer (row pct.) <sup>d</sup>
		Informal areas	Formal areas	Tenure <sup>a</sup>	Water connection	A business <sup>b</sup>	Skilled	Unskilled	Male-headed	Female-headed	
Percent of House holds below poverty line	74	58	75	82	42	74	62	81	52	77	
N	626	101	525	264	66	136	257	369	72	28	
Mean expenditure (monthly KSh)	15,909	15,399	15,940	15,897	26,487	17,465	19,099	14,274	15,718	14,504	
N	658	105	553	284	71	140	269	389	74	29	
Percent of households with expenditure: <sup>d</sup>											
Less than 3,000 KSh	2	2	2	2	0	2	0	3	1	3	5,553 (14%)
3,001-6,000 KSh	10	9	11	10	3	9	10	11	12	4	3,334 (41%)
6,001-9,000 KSh	15	15	15	15	11	12	12	17	15	17	2,959 (39%)
9,001-30,000 KSh	22	22	22	22	10	15	22	22	21	24	4,038 (38%)
13,001-18,000 KSh	20	21	20	18	14	24	17	21	17	30	3,862 (53%)
18,001-30,000 KSh	22	23	22	23	35	29	25	21	26	16	5,044 (62%)
31,001-75,000 KSh	8	7	8	9	20	9	13	5	8	6	11,102 (76%)
Above 75,000 KSh	1	0	1	1	7	1	2	0	0	0	13,426 (80%)
N	658	105	553	284	71	140	269	389	74	29	328
Cash transfers <sup>e</sup>	5,659	3,558	5,780	6,818	5,768	8,402	5,752	5,528	3,886	2,000	
N	135	13	122	85	11	19	43	92	6	7	

Notes:

- Household possesses deed or other officially recognized document conferring ownership of the structure, land, or both.
- "Business" refers to a self-employed activity that may or may not entail household or wage employees.
- Includes those self-declared as "skilled" as well as "professional".
- An imputed 30-day value from responses over several periods (7 days for food, 30 days for other consumables, 12 months for durables and annual services). See Volume I in the Overview Report. No significance test performed on this column.
- Transfers are cash outflows over last three months averaged over households with such flows (equal to proportion of row households in parentheses).

**Table B.2b: Monthly household spending power, as measured by income**

Characteristic	All	Location		Household has...			House hold head is <sup>c</sup>		Gender (Informal)		Value of remittance (row pct.) <sup>e</sup>
		Informal areas	Formal areas	Tenure <sup>a</sup>	Water connection	A business <sup>b</sup>	Skilled	Un-skilled	Male-headed	Female-headed	
Proportion of households with income: <sup>d</sup>											
Less than 3,000 KSh	9	0	10	11	4	8	2	13	0	0	5,256 (37%)
3,001-6,000 KSh	20	12	20	21	10	16	8	26	7	22	6,308 (23%)
6,001-9,000 KSh	16	16	16	18	7	18	9	19	12	30	10,491 (27%)
9,001-30,000 KSh	18	20	18	17	2	19	22	16	21	18	11,570 (16%)
13,001-18,000 KSh	13	16	13	11	21	12	19	10	16	18	19,373 (18%)
18,001-30,000 KSh	15	16	15	16	22	21	22	12	19	7	16,122 (25%)
31,001-75,000 KSh	8	16	7	5	29	4	16	3	20	5	41,612 (14%)
Above 75,000 KSh	1	4	1	1	4	1	2	0	5	0	60,000 (14%)
N	536	78	458	244	60	110	220	316	55	21	115
Cash remittances <sup>e</sup>	14,424	8,631	14,615	14,823	8,172	6,221	19,492	12,405	6,827	11,091	
N	135	13	122	85	11	19	43	92	6	7	

**Notes:**

- Household possesses deed or other officially recognized document conferring ownership of the structure, land, or both.
- "Business" refers to a self-employed activity that may or may not entail household or wage employees.
- Includes those self-declared as "skilled" as well as "professional".
- Total household cash income in KSh, previous month, not including in-kind income or cash assistance from/to family or friends who live outside the household. No significance test performed on this column.
- Remittances are cash inflows over last three months averaged over households with such flows (equal to proportion of row households in parentheses).

### B.3 Household Wealth Composition

The "household wealth index" is calculated from the household's declared ownership of a list of common household items. The value itself is created by totaling the estimated value of each item (indicated in brackets, in USD), converting to KSh, and dividing by 1,000; so the average of 38.9 means that the average household owned approximately 38,900 KSh worth of listed possessions. However, since each possible possession was only counted once, this should not be taken as a reliable estimate, but rather a unitless index of comparison.

This index of household wealth is significantly higher in formal vs. informal areas but not for and non-poor vs. poor households or male-headed vs. female headed households. There are significant differences by area type, with higher holdings of Class 3 durables and farm animals in formal areas, but the reverse is true for entertainment. There are also significant differences between poor and non-poor households, with higher holdings of Class 1 and 2 goods, as well as entertainment equipment, in non-poor households, but in farm animal holdings poor households have significantly higher holdings. There are no statistically significant differences by gender of household head in the holdings of any type.

Home and land values questions had a high number of missing or “don’t know” responses, which means that the averages shown are drawn from a relatively small group and tests of statistical significance were not possible. The data reveals that for those who owned homes alone values averaged 207,000 KSh while for those who owned both home and land combined values averaged 1,819,000 KSh. “Other land and/or residence” values averaged 575,000 KSh.

**Table B.3: Household wealth composition**

Characteristic	All	Location		Household poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Index of household wealth <sup>a</sup>	38.9	21.9	39.9	38	40.4	23.1	18.8
N	658	105	553	422	204	74	29
Household’s average holdings of:							
Class-1 durables (furniture, pans, iron, mosquito net) [7]	5.4	5.3	5.4	5.3	5.7	5.3	5.1
Class-2 durables (stove, sewing machine, fan, wheelbarrow, water storage tank) [60]	1.2	1.1	1.2	1.1	1.6	1.2	1.0
Class-3 durables (refrigerator, washing machine, electric generator, bicycle) [100]	0.1	0.0	0.2	0.1	0.2	0.1	0.0
Farm animals (poultry and livestock) [200]	1.0	0.0	1.1	1.1	0.7	0.0	0.0
Entertainment equipment (radio, TV, satellite dish, DVD, video player) [80]	1.5	1.8	1.5	1.3	2	1.9	1.5
Motorized transport (motorcycle [400], car [1,000])	0.0	0.0	0.0	0.0	0.1	0.0	0.0
N	658	105	553	422	204	74	29
Value of primary residence, not its land (in 1,000 KSh) <sup>b</sup>	207	1,592	50	226	50	1,000	1,000
N	4	2	2	3	1	1	1
Value of primary residence and its land (in 1,000 KSh) <sup>b</sup>	1,819	2,217	821	2,217	821	1,750	1,000
N	88	3	85	62	18	2	1
Value of other land and/or residence (in 1,000 KSh) <sup>c</sup>	532	532	-	705	469	532	-
N	10	10	0	3	6	10	0

**Notes:**

- This is a class-weighted average of the number of items as disaggregated in this same table, multiplied by the weight given within the square brackets [].
- About 86% of the sample had missing values for this amount, though at about the same frequency across the categories of this table. About half the sample that declared owning land or a residence failed to report its value. Averages are only over households with the asset. See “Proportion of Owners” in Table C.1. Note that values in the last three rows of the table are divided by one thousand.
- Since the survey does not ask the value of these, they have been imputed as a percent of primary residence value where it was declared (see Footnote (b)). These imputations are: land in city (10%), land outside city (5%), residence only in city (40%), and residence only outside of city (28%). If household has both land and structure these are scored separately and added together. In the case where the land of primary residence is not owned the value of the residence is first doubled before the imputations are made.

## B.4 Household Finance

Only 53% of all households in Kitui have a bank account, a number that differs significantly by location; perhaps surprisingly, over 67% in informal areas have a bank account while only 52% have a bank account in formal areas. Having a bank account also differs significantly by poverty status; 77% of the non-poor have a bank account while only 47% of the poor have a bank account. The percentage of households with loans sums to only 3% across the given sources of loans, and bank loans are the most common source of lending. The percent of households with a bank loan is significantly higher among non-poor vs. poor

households. Consistent with findings mentioned above, far more households (50%) sent money to people not living at the household than received money (23%). The only significant differences in the percent of households receiving cash from those not living at their residence was by area; formal area households were significantly more likely to receive money than informal-area households (24% vs. 14%). Households are significantly more likely to send money if they informal-area households vs. formal-area households, if they are non-poor vs. poor and if they are male-headed vs. female-headed.

**Table B.4: Household finance**

Characteristic	All	Location		House hold poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Percent of households with a bank account	53	67	52	47	77	66	70
N	648	104	544	414	203	73	29
Percent of households with a loan	3	4	3	2	7	6	0
N	640	100	540	412	200	69	29
Percent of households with a loan from a...							
Bank	2	1	2	1	5	66	70
Microfinance institution	0	1	0	0	2	1	0
Savings/credit group or co-op	1	2	1	0	3	3	0
Relative/friend	0	0	0	0	0	0	0
Informal lender	0	0	0	0	0	0	0
N	658	105	553	422	204	74	29
Percent of HHs receiving cash from those not now living at residence <sup>a</sup>	23	14	24	24	24	11	22
N	654	104	550	419	203	73	29
Percent of HHs sending cash to those not now living at residence <sup>a</sup>	50	68	49	45	71	78	44
N	657	105	552	421	204	74	29

a. Over the previous twelve months.

## B.5 Household-Owned Business Profile

Twenty-two percent of households own a business, and 72% of these engage in some form of selling. Business ownership is not significantly more common in formal areas than informal areas, or among non-poor vs. poor households, or by gender of head of household. Most businesses tend to be fairly new and quite small, as the average age for a business is just one year and the average number of employees is just under two; most of those employees are household members. About 60% of all businesses are not registered at all and 36% are registered with a local authority; most businesses report paying local market fees (16%) or business permits (59%). The relatively low number of observations at the census tract level means that it is not possible to perform tests of statistical significance for most of Table B.5.

**Table B.5: Household-owned business profile**

Characteristic	All	Location		House hold poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Percent of house hold with business ownership, last 12 months	22	30	21	23	23	26	39
N	658	105	553	422	204	74	29
Type of business: <sup>a</sup>							
Manufacturing	8	12	7	10	2	19	0
Selling	72	70	72	69	85	63	88
Transport	13	0	14	16	0	0	0
Professional (including Internet)	0	0	0	0	0	0	0
Other (barber, cleaning, etc.)	12	21	11	11	13	22	12
N	140	28	112	100	36	15	12
Years in operation	1	1.2	1	1.2	0.5	0.9	1.7
N	137	28	109	97	36	15	12
Number of employees	1.7	2.2	1.7	1.7	1.9	2.7	1.5
N	140	28	112	100	36	15	12
Which are...							
Household members	1.4	1.5	1.4	1.4	1.5	1.7	1.3
N	139	28	111	99	36	15	12
Non-household members	0.3	0.7	0.3	0.3	0.4	1	0.2
N	140	28	112	100	36	15	12
Revenue in previous month <sup>b</sup>	10,668	22,424	9,498	12,151	6,964	32,886	7,196
N	98	21	77	70	25	10	10
Registration status:							
Local authority (municipal or city council)	36	35	36	37	36	36	28
Kenya Revenue Authority	4	4	4	5	0	6	0
Registrar of Companies	1	4	1	1	0	6	0
None of the above	60	61	60	59	63	59	72
N	140	28	112	100	36	15	12
Share of businesses making fiscal contributions:							
Daily market local fee	16	31	15	21	5	26	44
Single business permit local fee	59	37	61	56	67	44	18
Value Added Tax	3	0	4	4	1	0	0
N	140	28	112	100	36	15	12

Notes:

- a. Households were allowed to choose more than one category so these figures may exceed 100%.
- b. Average over only those businesses operating over the period.

# DWELLING TENURE, SECURITY, AND CHARACTERISTICS

## C.1 Household Dwelling Characteristics

On average, households in Kitui have 1.8 members per room, a ratio that is significantly higher in poor vs. non-poor households, but not in informal vs. formal areas or male-headed vs. female headed households. Households have fewer than one bathroom on average. Forty-eight percent of households have a kitchen; a figure that is significantly higher in formal vs. informal areas (49% vs. 19%).

Fuel use in households in Kitui differs significantly by area. In informal areas, 59% use charcoal, 21% use paraffin/kerosene and 14% use gas; 3% use electricity and none use firewood. In contrast, in formal areas, 53% use firewood as their primary cooking fuel, followed by 32% who use charcoal, the remaining 13% are almost evenly split between paraffin/kerosene and gas; none in formal areas use electricity. Non-poor households are significantly more likely to use gas or paraffin/kerosene, while poor households are significantly more likely to use firewood. Male-headed households are also significantly more likely to use gas as primary cooking fuel than female-headed households.

Most households own their land and structure (61%), with only 35% renting. In formal areas households are significantly more likely to own and less likely to rent vs. informal areas; in formal areas, 65% own land and building, while only about 6% own both in informal areas and 92% rent in informal areas. Actually, poor households are significantly more likely to own and less likely to rent vs. poor households; in poor households, 66% own land and building, while only about 43% own both in non-poor households. Ownership did not vary significantly by gender of head of household.

Environmental hazards vary significantly by location, poverty status, and gender. In informal areas, 24% report that the area around their dwelling floods during heavy rains, while in formal areas only 3% percent of households report they are susceptible to flooding. Male-headed households report susceptibility to flooding at a much greater and significantly higher rate than female-headed households (31% vs. 7%). Mudslides are virtually zero percent reported on average, although there is a small and significantly higher percentage in informal areas (4%). In informal areas, fully 69% report that they live within a ten-minute walk of a formal or informal garbage dump, compared to only 18% in formal areas; perhaps surprisingly, this figure is significantly lower among poor vs. non-poor households. Male-headed households report living near a garbage dump at a much greater and significantly higher rate than female-headed households (77% vs. 45%). Only 1% overall report they are exposed to factory pollution in their neighborhood, although it is significantly higher in informal areas (4%) than in formal areas (0%).

More households in formal areas have an earth or clay floor (24%) as compared to informal areas (2%), an atypical result that may be explained by the fact that in Kitui, formal settlements have greater poverty than informal settlements (recall Table B.2). Almost all households have an iron or grass roof and stone walls across all categories.

**Table C.1: Household dwelling characteristics**

Characteristic	All	Location		House hold poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Number of persons per room	1.8	2.1	1.8	2.0	1.4	2.0	2.0
N	658	105	553	422	204	74	29
Number of bathrooms	0.8	0.7	0.8	0.8	0.8	0.7	0.6
N	656	105	551	420	204	74	29
Proportion of residences with kitchen	48	19	49	45	47	22	10
N	658	105	553	422	204	74	29
Primary cooking fuel:							
Electricity	0	3	0	0	0	2	5
Paraffin or kerosene	7	21	7	5	15	18	29
Gas	7	14	6	2	20	18	4
Charcoal	34	59	32	33	41	57	63
Firewood	50	0	53	58	21	0	0
N	646	103	543	416	199	72	29
Proportion of households that:							
Total	100	100	100	100	100	100	100
Owens the land only	1	1	2	2	1	0	3
Owens structure only	1	1	1	2	1	1	3
Owens land and structure	61	6	65	66	43	5	9
Rents	35	92	31	29	54	95	86
Squats	1	0	1	1	2	0	0
N	658	105	553	422	204	74	29
Pct. of households in areas subject to <sup>a</sup> :							
Flooding <sup>b</sup>	4	24	3	4	5	31	7
Mudslides <sup>c</sup>	0	4	0	0	1	3	8
10 minute walk to formal or informal garbage dump	21	69	18	16	38	77	45
Factory pollution (air, water, noise)	1	4	0	0	1	0	11
N	658	105	553	422	204	74	29
Housing quality:							
Pct. with earth/clay floor	23	2	24	26	7	3	0
Percent with corrugated iron roof	99	100	99	99	98	100	100
Percent with grass roof	0	0	0	0	0	0	0
Percent with stone/brick/block walls	99	99	99	99	100	99	100
N	658	105	553	422	204	74	29

**Notes:**

- a. All data is self-reported, and therefore subjective.
- b. Households reported that the area floods during heavy rains.
- c. Households reported that they are located on a hillside that is subject to mudslides.

## C.2 Home and Land Ownership

As seen in the previous table, housing in Kitui is unusual in that informal areas and non-poor households have a significantly higher percentage of renters than formal areas and poor households, where ownership is more common. Almost all households in Kitui feel they have secure tenure; this is likely influenced by the fact that virtually no respondents reported having been evicted in the last 12 months. Most landowners have a freehold title for their land (81%); the next-most common category is to have no documentation (18%). There is not enough data at the census tract level to test for significant differences in ownership security or documentation.

Neighborhood mobility is low. On average, households have lived in their current dwelling for 13.4 years and in their current neighborhood for 15.2 years. Years in dwelling and neighborhood are higher for formal areas than informal areas, poor vs. non-poor households, and male-headed vs. female-headed households.

Home loan payment as a percent of spending payments average 14%; however, there only seven observations and not enough data at the census tract level to test for significant differences by category of household.

**Table C.2: Household residence and land tenure**

Characteristic	All	Location		House hold poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Percent of households that:							
Total	100	100	100	100	100	100	100
Own the land only	1	1	2	2	1	0	3
Own structure only	1	1	1	2	1	1	3
Own land and structure	61	6	65	66	43	5	9
Rent	35	92	31	29	54	95	86
Squat	1	0	1	1	2	0	0
N	658	105	553	422	204	74	29
Percent of households that feel secure in ownership							
Total	98	86	98	98	96	73	100
N	284	9	275	208	56	5	4
Variability of households feeling secure <sup>a</sup>							
Total	0	0	0	0	0	0	0
N	284	9	275	208	56	5	4
Percent of households that experienced eviction							
Total	0	0	0	0	1	0	0
N	658	105	553	422	204	74	29
Proportion of house hold owners by type of land-possession document:							
Total	100	100	100	100	100	100	100
None	18	35	17	18	20	0	53
Freehold title	81	38	81	80	79	41	37
Temporary occupation license	0	0	0	0	0	0	0
Share certificate	0	0	0	0	0	0	0
Government certificate of title <sup>b</sup>	0	27	0	0	1	59	10

Characteristic	All	Location		House hold poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Letter from chief (provincial administration)	0	0	0	0	0	0	0
Other	1	0	1	1	0	0	0
N	291	10	281	210	60	4	6
Neighborhood mobility							
Years in dwelling	13.4	5.0	13.9	14.6	8.7	13.9	3.6
N	658	105	553	422	204	555	74
Years in neighborhood	15.2	6.1	15.8	16.7	9.9	15.8	4.6
N	658	105	553	422	204	74	29
Home loan payment as a percent of spending power <sup>c</sup>	14	15	14	14	-	-	14
N	7	1	6	7	0	0	7

**Notes:**

- a. Computed as the intra-class correlation coefficient, where the “class” is the EA. This measures the extent to which households within an EA resemble each other in their feelings of security in ownership. No significance tests performed on this row.
- b. Long-term lease from City council/Government.
- c. Computed only for those with a housing loan.

### C.3 Distribution of Housing Values and Rents

The average value of homes in Kitui is 1,769,000 KSh, and 92% of all home values are between 9,000-2.5 million KSh. Among rent-paying tenants, the average rent is 2,201KSh per month, with a fairly even distribution of households along the rent level spectrum. In this table there were not enough observations at the census tract level to test for differences among different categories of households, save for rent by gender, where male-headed households have significantly higher rents than female-headed households in the highest rent category.

**Table C.3: Distribution of housing values and rents**

Characteristic	All	Location		Household has...			House hold head is.. <sup>c</sup>		Gender (Informal)	
		Informal areas	Formal areas	Tenure	Water connection	A business	Skilled	Unskilled	Male-headed	Female-headed
Average home value (1,000 KSh) <sup>a</sup>	1,769	1,451	1771	1,819	1,157	1263	3498	759	1,500	1410
N	92	5	87	88	12	15	31	61	3	2
Distribution of home values: Total	100	100	100	100	100	100	100	100	100	100
1-8,999 KSh	2	0	2	2	0	0	4	1	0	0
9,000-299,999 KSh	27	0	27	25	10	30	10	37	0	0
300,000-999,999 KSh	33	15	33	34	15	40	31	34	33	0
1,000,000-2,499,999 KSh	32	69	32	33	67	21	47	24	33	100
2,500,000-250,000,000 KSh	6	15	6	6	8	9	9	5	33	0
N	92	5	87	88	12	15	31	61	3	2
Average monthly rent (tenants) <sup>b</sup>	2,201	2,202	2,200		5,495	2,028	2,613	1,850	2,440	1,500
N	353	94	259		38	83	179	174	68	24
Distribution of monthly rents: Total	100	100	100		100	100	100	100	100	100
1-899 KSh	20	13	22		0	33	12	28	13	14
900-1,499 KSh	22	21	22		1	18	24	20	17	33
1,500-1,999 KSh	14	15	14		4	5	13	15	12	27
2,000-3,499 KSh	26	26	25		26	28	26	25	27	22
3,500-150,000 KSh	18	24	17		69	16	26	12	31	4
N	353	94	259		38	83	179	174	68	24

**Notes:**

- a. Self-reported, current, monthly, fair-market price (response to the question, "If you were to sell your house, how much do you think you could sell it for?").
- b. Excludes imputed owner-occupied rents.
- c. Includes those self-declared as "skilled" as well as "professional".

## C.4 Neighborhood Social Capital and Civic Participation

Table C.4 presents findings on households' civic participation, social activism, and social capital. Kitui has high civic participation; nearly 40% of households reported contacting their local council within the last two years, and 50% attended a local forum. Owners were significantly more likely than renters to engage in both types of civic participation, as were those in formal areas and in the lower half of access to infrastructure. These results seem contradictory until we recall from Table C.2 that, in Kitui, ownership is higher among the poor than the non-poor; we also saw in Table B.2 that there are more poor in formal areas than informal areas, so all the higher participation groups are actually majority economically disadvantaged groups. Participation rates did not differ significantly by gender of household head.

For elections, turnout was also quite high. In local elections, turnout was 55% on average; turnout was even higher for the 2007 elections and 2010 referendum (83% and 79%, respectively). Similar to civic participation, those in formal areas were more likely to have voted in all three than those in informal areas, as were those in the lower half of infrastructure vs. the upper-half and owners vs. renters. Voting rates did not significantly differ by gender of household head.

A robust 89% of households reported having an informal community or neighborhood leader; again, this was significantly higher among those in formal areas vs. informal areas and among owners vs. renters but did not differ significantly by infrastructure access or gender of household head. Only 8% of households took part in a public demonstration or protest in the last two years, a rate which did not significantly differ by area, infrastructure access, gender of household head, but only by ownership status.

The survey asked respondents whether people in their neighborhood would cooperate if asked by an official to conserve water or electricity because of an emergency, and whether people in their neighborhood look out for each other. As seen in Table C.4b, on both questions, the results were positive. When asked if people in their community would cooperate if asked by an official, the results averaged 3.4 on a four-point scale (where 4=“very likely” and 1=“very unlikely” to cooperate). When respondents were asked if they agreed that people look out and trust each other in their neighborhood, answers averaged 4.1 on a five-point scale (where 1=“strongly disagree” and 5=“strongly agree”). On both social capital measures, scores were significantly higher for owners than renters, and cooperation scores were significantly higher those in formal areas than informal areas. There were not significant differences on either question by infrastructure or gender.

**Table C.4a: Neighborhood social capital and civic participation**

Characteristic	All	Location		Access to infrastructure <sup>a</sup>		Gender (Informal)		Tenure <sup>b</sup>	
		Informal areas	Formal areas	Lower half	Upper half	Male-headed	Female-headed	Own	Rent
Civic participation									
Percent of households... contacting local council	37	8	39	46	24	9	0	51	13
N	656	104	552	327	329	73	29	288	368
attending a neighborhood forum	50	8	52	59	37	10	3	69	16
N	657	105	552	327	330	74	29	288	369
Social activism									
Percent of households voting in... local election <sup>(c)</sup>	55	21	57	63	44	22	15	72	27
N	657	105	552	327	330	74	29	288	369
2007 general election <sup>c</sup>	83	70	83	84	81	72	61	93	65
N	658	105	553	327	331	74	29	288	370
2010 referendum <sup>c</sup>	79	67	79	79	78	71	56	88	63
N	658	105	553	327	331	74	29	288	370
Percent of households with informal community or neighborhood leader	89	70	90	92	85	64	87	96	75
N	569	92	477	295	274	67	23	277	292
Percent of households that took part in a public demonstration or protest	8	0	8	7	8	0	0	11	2
N	657	105	552	327	330	74	29	288	369

**Notes:**

- Defined by dividing the population in half based on a score assigned using responses from thirteen infrastructure-related questions (see Section 3 of Introduction.)
- Alternatively, this could be the length of time living in the neighborhood: less/more than (say) 2 years.
- Out of all households and not just those registered to vote.

The overwhelming majority of households (83%) reported feeling safe in their neighborhood, with statistically significant higher percentages among owners vs. renters and among those in formal areas vs. those in informal areas.

**Table C.4b: Neighborhood social capital and civic participation**

Characteristic	All	Location		Access to infrastructure <sup>a</sup>		Gender (Informal)		Tenure <sup>b</sup>	
		Informal areas	Formal areas	Lower half	Upper half	Male-headed	Female-headed	Own	Rent
Social capital									
Average HH response to:									
People in my neighborhood cooperate if asked by an official <sup>c</sup>	3.4	3.2	3.4	3.3	3.4	3.2	3.3	3.4	3.2
N	625	99	526	312	313	69	28	278	347
People in my neighborhood look out for/trust each other <sup>d</sup>	4.1	4	4.1	4	4.1	4.1	3.9	4.2	3.9
N	649	102	547	322	327	72	28	285	364
Proportion of HHs feeling safe from crime in own neighborhood	83	61	84	83	83	55	75	87	74
N	658	105	553	327	331	74	29	288	370

**Notes:**

- a. Defined by assigning scores using responses from thirteen infrastructure-related questions.
- b. Alternatively, this could be the length of time living in the neighborhood: less/more than (say) 2 years.
- c. Four-point scale where 1="Very unlikely" to 5="Very likely".
- d. Five-point scale where 1="Strongly disagree" to 5="Strongly agree".



## INFRASTRUCTURE SERVICES

### D.1a Water Access

Only 40% of households have direct access to piped water (31% in compound and 9% directly into the dwelling), and 53% report having nearby access (within 50 meters) to piped water. Direct access to water in the dwelling is rare at 9%, and the only significant difference is by poverty status; 20% of the non-poor have a private connection while only 5% of the poor do. However, for piped water access in compound, there were significant differences by all categories. First, there are significant differences by home ownership, where “secure” represents owners who feel no one could force them to leave without an official legal process in which they would participate, “insecure” represents owners who feel they could be forced out, and “rent” represents those who rent their homes and therefore have no security of ownership as well as squatters and those who own their dwelling but not land. Renters have the highest access to piped water in compound, followed by secure owners and insecure owners (recall again, that renting is more common among the non-poor than owning). Those in informal (recall, higher income in informal areas) areas had a significantly higher percent with piped water connection in compound than in formal areas, as did the non-poor vs. the poor and male-headed vs. female headed households. On average, it takes respondents over two hours and 45 minutes a day to obtain water, including travel to and from the water source, waiting time, and filling time; the average was nearly half that among renters and in informal areas, but there was not enough data at the census tract level to test for statistically significant differences. Water costs an average of 538 KSh a month; here again, there was not enough data at the census tract level to test for statistically significant differences between categories of households.

Despite the fact that nearly 40% of households have direct access to piped water in their dwelling or compound, only 8% of respondents report that piped water is their most important water source, although it is significantly higher among the non-poor than the poor (18% vs. 4%). The most cited primary source by households is vendor (31%), some 21% report a shared tap as most important, 22% list a natural source outside household, and 11% list a well or borehole as their most important water source. There are significant differences in primary water source distribution by ownership status, indicated by italics; renters had a significantly higher percent that cited piped water in compound as their primary source (33%) than secure owners (14%) and insecure owners (5%), but renters also had the highest percent (49%) primarily relying on vendors as a water source. Owners with secure status rely on a variety of sources, with natural sources cited most commonly as primary water source (32%). The majority of owners with insecure status rely on natural sources as their primary water source (71%).

Not surprisingly, in informal areas, a significantly percentage rely on vendors as primary water source (55%) than in formal areas (30%). However, interestingly, in formal areas, a significantly higher percentage relies on natural sources and wells/boreholes than in informal areas, perhaps correlated with the higher poverty in formal areas. Non-poor households are significantly more likely than poor households to cite shared tap as their primary source (35% vs. 16%); poor households are more likely to cite natural sources or neighbors (27% natural and 9% neighbors) vs. non poor (5% natural and 2% neighbors). Finally, male

headed- households are significantly more likely than female headed-households to cite shared tap as their primary source (37% vs. 13%) while female headed-households are significantly more likely than male headed- households to cite vendors as their primary source (76% vs. 47%).

Of the households that didn't have access to piped water, the main reason given (49%) was an inability to afford the initial connection (although relatively few were unable to afford a water bill); the second most common reason (18%) was that they rented rather than owned their home and their landlord would not pay for a connection, and 15% said service was not available. There was not enough data at the census tract level to test for statistically significant differences between categories of households for the reasons for lack of access to a water connection.

**Table D.1a: Water access**

Characteristic	All	Security of Ownership <sup>a</sup>			Location		House hold poverty		Gender (Informal)	
		Secure	Insecure	Rent	Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Percent of households with private piped water connection inside dwelling	9	9	6	9	6	9	5	20	8	0
N	657	271	12	374	105	552	422	204	74	29
Percent of households with piped water connection in compound	31	26	11	41	48	30	24	52	57	27
N	657	271	12	374	105	552	422	204	74	29
Percent of households close to piped water access <sup>b</sup>	53	46	32	69	67	52	52	73	71	60
N	374	183	10	181	51	323	282	75	29	20
Monthly cost of water in ... Time (minutes) <sup>c</sup>	1,038	1,228	1,357	634	459	1,073	1,126	627	436	501
N	446	203	10	233	71	375	324	103	45	24
Money (KSh)	538	633	640	423	330	554	494	656	338	312
N	405	143	5	257	75	330	256	128	49	24
Most important water source: Total	100	100	100	100	100	100	100	100	100	100
Piped	8	8	6	9	5	8	4	18	7	0
Bottled	0	0	0	0	1	0	0	0	1	0
Shared tap connection	21	14	5	33	31	20	16	35	37	13
Vendor (kiosk, tanker, other)	31	21	18	49	55	30	32	32	47	76
Neighbor(s)	7	11	0	1	5	7	9	2	5	6
Well/borehole	11	14	0	5	4	11	12	8	3	6
Natural source outside household	22	32	71	3	0	23	27	5	0	0
N	658	272	12	374	105	553	422	204	74	29
No connection due to:	100	100	100	100	100	100	100	100	100	100
Other sources available	3	4	6	1	0	4	2	8	0	0
Renting <sup>d</sup>	18	0	0	60	68	16	16	38	70	71

Characteristic	All	Security of ownership <sup>a</sup>			Location		House hold poverty		Gender (Informal)	
		Secure	Insecure	Rent	Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Can't afford connection	49	58	72	29	12	51	49	52	7	19
Can't afford monthly bill	2	2	4	2	10	2	2	2	12	8
Provider has waiting list	9	11	0	4	2	9	10	0	2	3
No service available	15	21	18	3	2	16	17	1	0	0
Other	3	4	0	1	6	3	3	0	9	0
N	371	182	10	179	51	320	280	75	29	20

Notes:

- Self-reported; "secure" includes owners who feel no one could force them to leave without an official legal process in which they would participate, "insecure" includes owners who feel they could be forced to leave without an official legal process, and "rent" includes renters, squatters, and people who own their structure but not land.
- Respondents were asked whether there were dwellings or businesses within 50 meters of their home that had a piped water connection in the dwelling or compound.
- Calculated as the sum of time spent travelling, waiting in line, and filling containers.
- House does not have a connection and landlord will not pay for one.

## D.1b Water Quality

For the large number (245) reporting vendors as primary water source, about half (47%) rated the quality of water as "good" while another half rated it as "fair." Among the 170 citing shared tap as their primary sources, 69% rated the quality of water as good and 31% rated the water quality as fair, and the difference between all 3 ratings were significant, as indicated by italics. However, for the 89 households citing natural outside sources as primary water source, only 12% rated is as good, while 50% rated it as fair and 38% as poor, and the difference between all 3 ratings were significant. Most households (78%) said they used a public water provider, and 66% of those rated it as good while 34% of them rated it as fair. There was not enough data at the census tract level to test for significance.

In Kitui, 51% of households treat their drinking water, and there were no significant differences by category or tests were not able to be performed due to lack of observations. Of those who treat their drinking water, only 29% rate their water quality as good, another 51% rated it as fair, and 20% as poor, and the difference between all 3 ratings were significant. The most common method of water treatment is boiling (44%) followed by bleach (26%). For treatment method, there was not enough data at the census tract level to test for significance.

**Table D.1b: Water quality**

Characteristic	All	House hold poverty		Location		Water quality					Gender (Informal)	
		Poor	Non-poor	Informal areas	Formal areas	Good	Fair	Poor	Total	N	Male-headed	Female-headed
Water source: <sup>a</sup> Piped	8	4	18	5	8	57	43	0	100	65	7	0
Bottled	0	0	0	1	0	100	0	0	100	1	1	0
Shared tap connection	21	16	35	31	20	69	31	0	100	170	37	13
Other vendor	31	32	32	55	30	47	47	6	100	245	47	76
Neighbor(s)	7	9	2	5	7	70	24	5	100	27	5	6
Well/Borehole	11	12	8	4	11	60	36	3	100	58	3	6
Natural outside-HH source	22	27	5	0	23	12	50	38	100	89	0	0
N	658	422	204	105	553	340	269	49			74	29
Water provider: Public	78	76	77	73	78	66	34	0	100	226	77	49
Private	0	0	0	0	0	0	100	0	100	1	0	0
Self	12	11	14	0	13	77	23	0	100	24	0	0
Community	10	13	9	27	9	45	53	2	100	33	23	51
N	284	140	129	54	230	183	99	2			45	9
Percent of households treating drinking water	51	49	55	44	51	29	51	20	100	310	38	61
N	658	422	204	105	553	340	269	49			74	29
Treatment method: <sup>b</sup> Boiling	44	45	53	37	45	30	49	22	100	143	44	25
Add bleach/chlorine	26	77	61	71	74	25	53	23	100	220	24	16
Other (sieve, filter, settle)	0	0	2	0	0	100	0	0	100	1	0	0
N	310	199	97	40	270	106	160	44			24	16

**Notes:**

- a. Most important water source.
- b. Since multiple responses were permitted, the sum can exceed 100%. Likewise, "Other" is not shown, since it was negligible, so the sum may also be less than 100%.

## D.2a Electricity and Waste-Disposal Services

Only 35% of respondents reported access to electricity, a figure that differs significantly by location (77% in informal areas have access vs. 32% in formal (again, less wealthy) areas) and also by poverty level (53% of non-poor have access vs. 30% of the poor) but electricity access does not vary significantly by gender of head of household in informal areas. Reasons for not having a connection are similar to those for water – the primary reason reported was households inability to pay for the initial connection (59%) followed by provider waiting list (19%) and renting (did not own their home and didn't have a choice) (14%).

Only 1% of respondents reported functional street lighting in their area, a figure that differs significantly by location with informal areas more likely to have functional street lighting; however, it did not vary significantly by poverty status or gender of head of household in informal areas. The average monthly cost of electricity is 659 KSh, with 2% of households not paying for electricity at all. Seventy-two percent of households pay a utility company, while 27% of households either pay as part of their rent or directly to their landlord. In Kitui, 26% of households experience power outages at least once per week. In this section there were not enough observations at the census tract level to test for differences among different categories of households.

To dispose of their garbage, more than half of households report dumping their trash (58%) and 22% report burning. Dumping is significantly more common in informal areas and burning is significantly more common in formal areas. Only 2% overall dispose of refuse through a city, community, or private collection system although this is significantly higher in informal areas (8%) than formal (1%) and the difference is significant; there is also a small but significant difference by poverty status. Only 14% households report they pay for garbage collection; they were nearly all in informal areas, but there were not enough observations at the census tract level to test for differences among different categories of households.

**Table D.2a: Access to electricity and waste-disposal**

Characteristic	All	Location		House hold poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Electricity							
Proportion of households with access to electricity	35	77	32	30	53	78	78
N	657	105	552	421	204	74	29
Reason for no connection: Total	100	100	100	100	100	100	100
Renters	14	67	12	13	17	59	86
Firm has waiting list	19	4	20	16	36	6	0
Cannot afford connection	59	24	60	64	39	29	14
Cannot afford monthly bill	1	4	1	1	0	6	0
Other	7	0	7	5	8	0	0
N	329	27	302	235	72	19	7
Percent of households with mostly functioning street lighting	1	9	0	1	1	8	10
N	658	105	553	422	204	74	29
Average monthly bill, KSh	659	626	661	551	824	559	745
N	658	105	553	422	204	74	29
Percent of households not paying for electricity	2	0	2	3	1	0	0
N	166	27	139	87	71	18	9
Payment to: Total							
Utility	72	50	73	75	67	54	44
Prepaid card	0	4	0	23	33	6	0
Landlord	27	46	26	2	0	40	56
Third party (from utility power line)	0	0	0	0	0	0	0
N	162	27	135	84	70	18	9
Percent of households with outages at least once weekly	26	17	27	32	19	9	41
N	319	78	241	178	132	55	22
Refuse disposal							
Main method:							
Dumping	58	77	57	55	64	73	87
Burying	4	10	4	4	5	13	3
Burning	22	5	23	24	21	7	0
Collection system(a)	2	8	1	1	4	8	8
N	658	105	553	422	204	74	29
Proportion of HHs paying for collection	14	100	10	7	50	100	100
N	60	11	49	40	16	7	4

*Run by city, community, or private firm.*

## D.2b Access to Sanitation Services

On average, only 5% of households have a toilet in their home, but a private toilet is more than three times as common among non-poor vs. poor households (10% vs. 3%) and the difference is significant. The most common type of toilet system is a pit latrine (60%) followed by public/shared latrine (32%). In informal areas, flush toilets are significantly much more common but still only 20% have one. The use of flush toilets is also significantly higher in non-poor vs. poor households (19% vs. 4%) while public/shared latrines are significantly more common in female-headed (84%) vs. male-headed (45%). Public/shared latrines are significantly more common in informal areas (56%) than in formal areas (30%); in formal areas pit latrines are more common (62% in formal, vs. 22% in informal). Pit latrines are more common in poor vs. non-poor households.

Fifty-six percent of households report they share their toilet with other households, and 37% share with two to nine households. By area, formal areas are more likely to have their own toilet; 58% of households have their own toilet (don't share) while in informal (again, wealthier) areas only 9% have their own toilet, and the poor are more likely to have their own toilet than non-poor households; however, this "private" toilet is likely a pit latrine, as seen in the previous section. Finally, toilet sharing does not vary significantly by gender of head of household.

Almost all households (91%) use a pit latrine disposal system, although a significantly higher percentage of the non-poor use a legal sewer (12%) than the poor (3%) and a significantly higher percentage of those in informal areas use a septic tank (17%) than in formal (again, poorer) areas (2%).

Grey water, i.e. used kitchen or bath water, is dumped into a nearby drain by 49% of households and poured onto the road by 45% of households. Poor households are significantly more likely to pour grey water onto the road than non-poor households, who are more likely to dump into a nearby drain. Those in informal area households are significantly more likely to dump into a drain (63%) than those in formal settlements (48%).

**Table D.2b: Access to sanitation**

Characteristic	All	Location		House hold poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Percent of households with toilet in home	5	9	5	3	10	12	0
N	658	105	553	422	204	74	29
Type of toilet system: Total							
Pit latrine (individual)	60	22	62	65	40	27	10
VIP latrine	1	0	1	0	2	0	0
Flush toilet/WC	8	20	7	4	19	25	6
Public/shared latrine	32	56	30	31	39	45	84
Paid shared latrine	0	0	0	0	0	0	0
N	658	105	553	422	204	74	29
Percent of households sharing toilet:							
Doesn't share	56	9	58	61	40	10	3

Characteristic	All	Location		House hold poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Shares with 2-9 other households	37	69	36	34	48	69	67
Shares with 10+ other households	7	23	6	5	12	20	30
N	653	102	551	419	203	72	28
Type of disposal system for toilet:							
Total	100	100	100	100	100	100	100
Pit latrine	91	77	92	95	80	72	88
Sewer (legal)	5	3	5	3	12	4	0
Sewer (informal)	0	3	0	0	1	3	4
Septic tank/soak pit	3	17	2	2	7	21	8
N	653	104	549	420	201	73	29
Disposal of "grey water": Total							
Total	100	100	100	100	100	100	100
Dump into drain	49	63	48	48	62	60	69
Pour onto road	45	36	45	46	32	38	31
Pour into latrine	1	0	1	1	0	0	0
Other	6	1	6	5	6	2	0
N	655	105	550	421	203	74	29

### D.3 Access to Transport

Fifty-one percent of respondents said they work outside their neighborhood. The main modes of travel to work or school are walking (84%) and matatus (9%).<sup>15</sup> Those under the poverty line are significantly more likely to walk than those above, who are significantly more likely to use a matatu. Students are also significantly more likely to use a matatu than workers. Only one percent of non-poor households' members drove to work or school in their own vehicle.

<sup>15</sup> A "matatu" is a 14-seater minivan used throughout Kenya as a form of public transport.

**Table D.3 Access to transport**

Characteristic	All	House hold activity <sup>a</sup>		Location		House hold poverty		Gender (Informal)	
		Work	Study	Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Percent who work or study...									
inside the neighborhood	45			61	45	42	57	59	68
outside the neighborhood	51			39	51	54	42	41	32
inside and outside the neighborhood	4			0	4	4	1	0	0
N	950			139	811	636	273	109	30
Main mode of travel <sup>b</sup> Walk	84	89	90	89	84	86	76	88	94
Bicycle	1	0	0	0	1	1	0	0	0
Own vehicle	0	0	0	0	0	0	1	0	0
Matatu	9	7	10	8	9	7	15	10	3
Shared taxi	0	0	0	0	0	0	0	0	0
Bike taxi	4	2	0	2	4	4	5	1	2
Municipal bus	0	0	0	0	0	0	0	0	0
N	1,437	114	53	167	1,270	1,029	354	126	41
Transport time (minutes)	23	18	26	21	23	22	23	23	12
N	1,408	111	53	164	1244	1010	348	123	41
One-way trip cost to work/school (KSh)	149	126	253	166	148	134	149	183	55
N	203	14	6	20	183	130	63	17	3
Households with road access as: Poor	66			28	68	68	54	31	17
Good	34			72	32	32	46	69	83
N	656			105	551	421	204	74	29
Percent of households with limited road access during rainy season	1			0	1	1	1	0	0
N	655			105	550	420	204	74	29

Notes:

a. Informal areas only.

b. To work or to school. May not add to 100% since "Other", which was negligible, is not reported in table.

The average time it takes household members to get to work/school is 23 minutes and the average cost is 149 KSh; travel time is only 12 minutes on average for female-headed households, and the difference as compared to male-headed households' 23 minute average travel time is significant.

Sixty-six percent of households reported having "poor" road access, although significantly more rated it as "good" in informal (again, wealthier) areas (72%) than formal areas (32%) and a significantly higher percentage of non-poor households rated roads as good compared to non-poor households. Only one percent of all households said they had limited road access during the rainy season, and this was consistently low across all categories.

## D.4 Access to Communications

Almost no households have a functioning land line, but each household owns an average of 1.7 mobile phones. Mobile banking (such as M-PESA) use is 83% on average. For both measures, there were no statistically significant differences by category. Overall, only 3% of households have a functioning computer, and this rate is much higher in non-poor vs. poor households (9% vs. 1%), and the difference is statistically significant. Only 10% of households use the internet; this rate is also significantly higher in non-poor vs. poor households (21% vs. 6%).

**Table D.4: Access to communications**

Characteristic	All	Location		House hold poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-head-ed	Fe-male-head-ed
Percent of households with functioning land line	0	0	0	0	0	0	0
N	656	105	551	421	204	74	29
Average number of mobile phones owned by household	1.7	1.7	1.7	1.7	1.6	1.8	1.5
N	641	103	538	412	199	72	29
Percent of households using mobile banking	83	86	83	84	81	83	93
N	653	104	549	419	204	73	29
Percent of households with functioning computer	3	0	4	1	9	0	0
N	655	105	550	420	204	74	29
Percent of households using internet (any means)	10	12	10	6	21	11	16
N	654	103	551	419	204	72	29

## D.5 Access to Infrastructure Indicator

The access to infrastructure indicator combines six categories of infrastructure (divided into 13 subcategories) weighted by importance to the household and summed to create a household indicator from 0 to 9.5.<sup>16</sup> Higher scores represent better access to infrastructure. This indicator provides an overall understanding of a household's infrastructure access. By averaging households' scores on the indicator, we can quickly compare infrastructure access in informal and formal areas, between poor and non-poor households, and between male- and female-headed households in informal areas.

Table D.5 presents household mean scores on the access-to-infrastructure indicator. The mean score across all households in Kitui is 3.69. Households in informal areas score (wealthier, again) score significantly higher than households in formal areas, 4.18 vs. 3.66. There is also a significant difference between poor and non-poor households (3.53 and 4.27 respectively); this means that on average non-poor households have almost one more service available to them. There are no significant differences in infrastructure score by gender.

<sup>16</sup> The 13 subcategories are: piped water (1 point); shared/indirect connection (0.5 points); direct electricity access (1); street lighting (0.5); garbage collection system (1); own toilet (1); shared toilet with less than 20 other people (0.5); legal sewer system for toilet (0.5); grey water not poured onto street (0.5); good road access at dwelling (0.5); road access not limited during rainy season (0.5); no flooding (1); no mudslides (1).

**Table D.5: Access to infrastructure indicator**

Characteristic	All	Location		House hold poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Mean score on access to infrastructure indicator	3.69	4.18	3.66	3.53	4.27	4.22	4.13
N	658	105	553	422	204	74	29

# CONCLUSIONS

The following three figures are “Development Polygons”. These polygons are meant to complement the detailed tables presented in sections A through D by illustrating an “overall” sense of the state of the city. We present information for all areas, along with formal and informal areas, in each of the three figures: the Development Diamond, the Infrastructure Polygon, and the Living Conditions Diamond.<sup>17</sup> In all figures, the value labels included provide the value of the indicator for all areas. The statistics underlying these figures are also in the tables, above. Similar graphics also appear in the City-at-a-Glance Reports and the Overview Report produced under the NORC contract.

The axes for all figures represent percentages. Polygons with larger areas represent “better” situation in regards to the associated indicator(s). Hence, a polygon with full coverage would indicate that the city is doing very well in terms of development, infrastructure, or living conditions. Regarding differences by area, we must remember that in Kitui 80% of the sample is comprised of formal area households (94% weighted).

The Development Diamond (Figure 1) maps four indicators of poverty—welfare, employment, education, and living conditions. In three quarters of the development diamond—welfare, employment, and education—informal areas slightly outpace formal areas terms of living conditions. However, in both formal and informal areas, only a small percentage of households (6%) have permanent walls and access to piped water and electricity.

The Infrastructure Polygon, shown in Figure 2, presents residents’ access to ten different types of infrastructure -piped water, electricity, private toilets, sewage, drainage, garbage collection, street lighting, mobile phones, public transport, and good roads. Good roads, piped water and electricity are much more prevalent in informal areas than formal areas, though overall only about 35% of the population has access to each. Mobile phone usage is nearly ubiquitous, as 87% of households own one or more mobile phones (the average is 1.7) and this is similar for both formal and informal areas. About 25% of

Figure 1: Development diamond

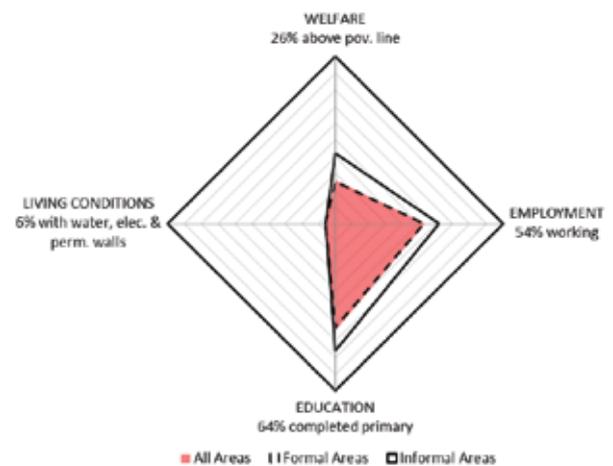
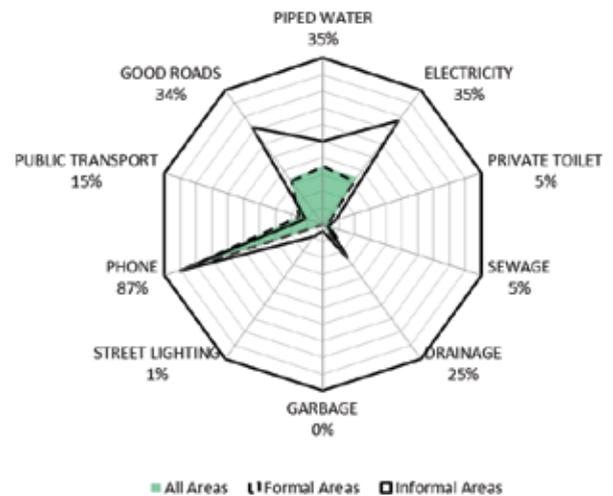


Figure 2: Infrastructure polygon

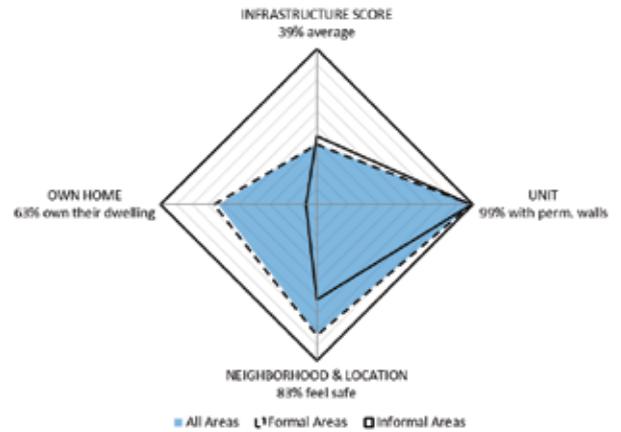


<sup>17</sup> The basic format for all three figures appear in the World Bank Policy Research Working Paper, “Poverty, Living Conditions, and Infrastructure Access” A Comparison of Slums in Dakar, Johannesburg, and Nairobi” by Sumila Gulyani, Debabrata Talukdar, and Darby Jack (2010). We strived to make our own figures as similar as possible, though some deviations, noted in the accompanying text, were necessary.

households report proper drainage and 15% use public transport. On all other measures – private toilets, sewage, garbage, and street lighting - access is quite low.

Figure 3 presents the Living Conditions Diamond. The four axes of this diamond are the infrastructure score (scaled to a percentage of the total possible score), unit conditions, neighborhood and location, and home ownership. Nearly all homes in all areas have permanent walls. By contrast, both informal and formal areas score only around 40% on the infrastructure score. In contrast with demographics and dwelling characteristics, formal areas tend to score better on neighborhood conditions and home ownership. The largest difference between formal and informal areas is in home ownership – 66% of households in formal areas are owners while this figure is only 7% in informal areas. Households in formal areas also report feeling safe in their neighborhood more frequently (84% vs. 61% in informal areas).

Figure 3: Living conditions diamond





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